

Work Order ID 61421

Wednesday, August 25, 2010 8:53:20 AM



Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Item Name: Replacement Skidtube

Stop



Start Date: 8/25/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 9/3/2010 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan:

[Signature]

Date:

10-8-25

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D2580

Rev D

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

N/A [Signature]

110

0.00



BENDING MACHINE - SKIDTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

[Large handwritten mark]
DD
SAD

10-9-2 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120  Skidtubes	Memo 1- Deburr ends 2- C'sink holes as per dwg without cutting fluid 3- Prepare tube for welding, remove alodine as required.	0.00 0.00							
130  QC	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00							
Quality Control									

Ⓟ BB 10/09/07

1 - BG 10/09/07

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Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

140

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Weld step D2576 as per Dwg. D2580 and QSI 004
A/R□□□ Aluminum Rod M114877

BE 10/09/07

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill
A/R□□□ Aluminum Rod M114877

BE 10/09/07

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64",
adjust stopper not to hit web. Debur

5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580.
Debur holes

BE 10/07/09

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Debur

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Debur

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Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150

QC10- Inspect visual per QSI004- ground welds

0.00

Sidorlor



QC

Memo

0.00

Quality Control

160

QC5- Inspect part completeness to step on W/O

0.00

Sidorlor



QC

Memo

0.00

Quality Control

①

170

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

BR 10-9-13 ①

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Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180



Powdercoat

Powder Coating

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00

BR 10-9-13.

M114841

Memo

0.00

START TIME: 11:20
OVEN TEMPERATURE: 320°
FINISH TIME: 11:00

①

190



QC

Quality Control

QC3- Inspect Part Finish

0.00

=> JY 10/09/13

Memo

0.00

1 9

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Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200



HandFinish

Hand Finishing

Memo

0.00

0.00

=) JH 10/09/13

x1

0

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

✓ A/R ☐ ☐ Sikaflex-291 ☒ M115112 ☐

Sikaflex expire date: 11/10

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

✓ 3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

✓ A/R ☐ ☐ Sikaflex-291 ☒ M115112 ☐

Sikaflex expire date: 11/10

✓ 5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: M115028

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Run Start
Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

0.00

8/10/09/14

(XO)

220



Packaging

Packaging

Packaging

0.00

Memo

Identify and pack for shipping as per PPPD205-634-041

Location:

PPP Rev:

PPP 61111

0.00

8/10/09/16

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

10/09/16

MF
10-9-16

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Start Date: 8/25/2010

Required Date: 9/3/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ
 IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD
 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D2580-1  205 Skidtube bent detail		Manufactured	No			110	Each	5.0000	1	1			

Location

Loc Qty

Loc Code

LG

4

B60953 => 1

57028

1

60956

1

61191

2

ST046

1

59856

1

D2576-3



Step (maching detail)

Manufactured No

140

Each

81.0000

1

1

Location

Loc Qty

Loc Code

LG

81

46661

33

52215

48

1 BE 10/09/07

W/O:		WORK ORDER CHANGES					
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Start Date: 8/25/2010

Required Date: 9/3/2010

Start Qty: 1.00

Required Qty: 1.00

D2579 Manufactured No 140 Each 404.0000 20 20



Crossbolt Spacer

Location Loc Qty Loc Code

LG	404	
57052	5	
57348	4	
58433	2	
59113	122	
60845	102	
61199	169	

BE 10/09/07

D2855 Manufactured No 200 Each 77.0000 1 1



Cap

Location Loc Qty Loc Code

FP6	1	
56613	1	
ST026	76	
50513	1	
50770	28	
51539	2	
53791	45	

10/09/13

AN3-5A Purchased No 200 Each 1,534.000 2 2



Bolt

Location Loc Qty Loc Code

ST350	1534	
105057	534	
115016	500	
115371	500	

10/09/13

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Start Date: 8/25/2010

Required Date: 9/3/2010

Start Qty: 1.00

Required Qty: 1.00

AN960JD10L NAS1149D0332J Purchased

No

200

Each

2,501.000

2

2



Washer



10/09/13

Location

Loc Qty

Loc Code

ST348

2501

110985

2501

X2

ALS7-1032-130 Purchased

No

200

Each

878.0000

50

50



Insert



10/09/13

Location

Loc Qty

Loc Code

FP

861

M114723

X50

115079

861

ST282

17

113238

17

AN3C4A Purchased

No

200

Each

1,831.000

50

50



BOLT



10/09/13

Location

Loc Qty

Loc Code

ST303

500

115438

500

V50

ST350

1331

114108

14

114416

12

114523

2

114941

303

115300

1000

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Required Date: 9/3/2010

Start Qty: 1.00

Required Qty: 1.00

AN960C10L NAS1149C0332 Purchased No

200

Each

179.0000

50

50



washer



10/09/13

Location

Loc Qty

Loc Code

ST245

179

107534

29

109545

78

111548

72

N1115000

850

D3566-13 Manufactured No

200

Each

26.0000

1

1



Gasket



10/09/13

Location

Loc Qty

Loc Code

FP012

26

59661

18

60209

8

xl

D3566-5 Manufactured No

200

Each

30.0000

1

1



Gasket



10/09/13

Location

Loc Qty

Loc Code

FP

22

60869

22

FP015

8

59158

8

yl

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Required Date: 9/3/2010

Start Qty: 1.00

Required Qty: 1.00

D3566-1

Manufactured No

200

Each

29.0000

2

2



Gasket



41 10/09/13

Location

Loc Qty

Loc Code

FP

5

1361656

x2

60857

5

FP015

24

57715

2

60202

12

61215

10

D3564-11

Manufactured No

200

Each

17.0000

1

1



Wearshoe



41 10/09/13

Location

Loc Qty

Loc Code

FP019

17

59941

4

60302

13

41

D3564-13

Manufactured No

200

Each

23.0000

1

1



Wearshoe



41 10/09/13

Location

Loc Qty

Loc Code

FP17

23

59660

11

60862

12

41

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Start Qty: 1.00

Required Qty: 1.00

D3564-9

Manufactured No

200

Each

20.0000

1

1



Wearshoe



HL 10/09/13

Location

Loc Qty

Loc Code

FP

1

55334

1

FP019

19

59201

6

60236

13

D3564-5

Manufactured No

200

Each

21.0000

1

1



Wearshoe



HL 10/09/13

Location

Loc Qty

Loc Code

FG

1

34806

1

FP19

2

57525

1

58709

1

FP-19

18

59157

6

60868

12

D2594-3

Manufactured No

200

Each

267.0000

16

16



O-Ring, 205 Skidtube



HL 10/09/13

Location

Loc Qty

Loc Code

FP

267

55546

19

58191

12

59358

236

Y16

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Required Date: 9/3/2010

Start Qty: 1.00

Required Qty: 1.00

D2594-1

Manufactured No

200

Each

355.0000

16

16



Plug, 205 Skidtube



10/09/13

Location

Loc Qty

Loc Code

FP

183

42807

112

55002

71

FP14

172

58434

15

59110

157

x16

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DART

DESIGN #	DRAWN BY RH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED #	APPROVED #	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

RELEASED
07-06-28 #

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL \varnothing 0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

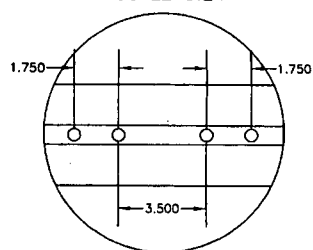
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

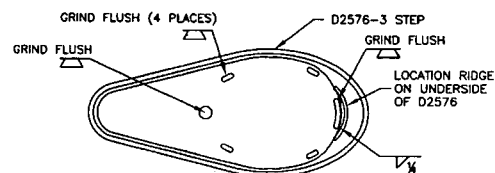
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

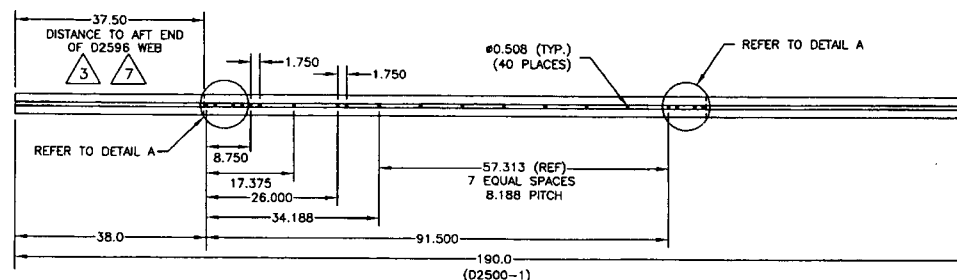
DETAIL A
SCALE 5:24



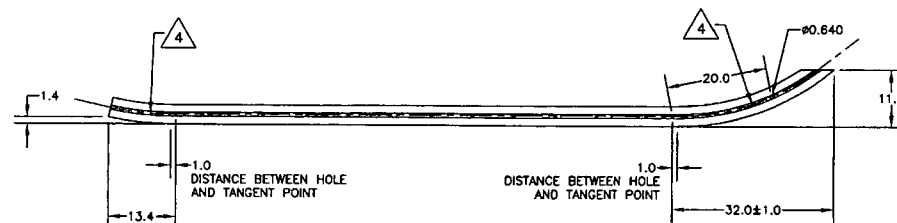
DETAIL B
SCALE 5:24



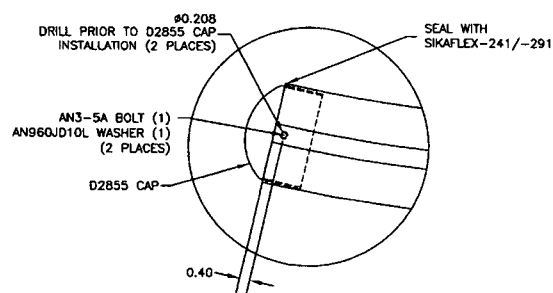
D2580-1 DRILLING DETAIL



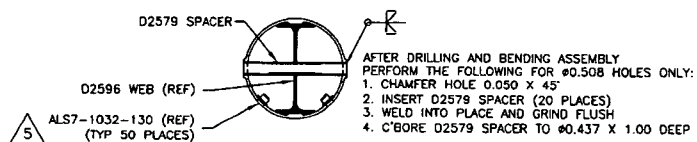
D2580-1 BENDING AND CUTTING DETAIL



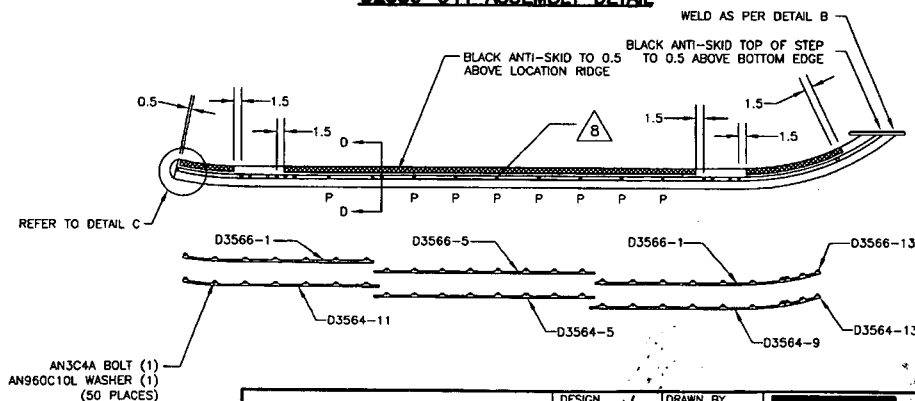
DETAIL C
SCALE 5:24



SECTION D-D
SCALE 5:24



D2580-041 ASSEMBLY DETAIL



D2580-041 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

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DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HAMPSHIRE, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO.	REV. D
DATE	07.02.27	D2580	SHEET 2 OF 3
		TITLE	SCALE
		205 SKIDTUBE ASSEMBLY	1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

RELEASED
07-16-28

Diagram illustrating the grinding locations on a propeller cross-section:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- LOCATION RIDGE ON UNDERSIDE OF D2576

Technical drawing of a circular component with various fasteners and dimensions. The drawing includes the following labels and dimensions:

- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)
- SEAL WITH SIKAFLEX-241/-291
- AN3-SA BOLT (1)
- AN960JD10L WASHER (1)
- (2 PLACES)
- D2855 CAP
- SEE NOTE ii)
- 0.40

Diagram showing the D2579 Spacer assembly. The assembly consists of a central web (D2596 WEB (REF)) and a spacer (D2579 SPACER). The spacer is shown with a chamfer hole (0.050 X .45") and a C-bore (D2579 SPACER TO #0.437 X 1.00 DEEP). The web is shown with a chamfer hole (0.050 X .45") and a C-bore (D2579 SPACER TO #0.437 X 1.00 DEEP). The assembly is shown with a cross-section view.

5

ALS7-1032-130 (REF)
(TYP 50 PLACES)

D2596 WEB (REF)

D2579 SPACER

AFTER DRILLING AND BENDING ASSEMBLY
FOLLOWING FOR #0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X .45"
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C-BORE D2579 SPACER TO #0.437 X 1.00 DEEP

- i) **FINISH:** ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE
WITH THE SPACER AT THIS LOCATION

[illegible]

Figure 1: Elevation view of the bridge deck showing dimensions and hole locations. The diagram includes a cross-section of the bridge deck with a curved bottom. Key dimensions include: 5.985 (width of the deck at the left end), 5.338 (REF) (width of the deck at the first hole), 51.340 (total length of the deck), 39.580 (length from the first hole to the second hole), 5.915 (width of the deck at the second hole), 3.630 (REF) (width of the deck at the second hole), 0.508 (8 PLACES) (width of the hole), 20.0 (width of the deck at the right end), 0.640 (width of the hole), 1.4 (width of the deck at the left end), 1.0 (DISTANCE BETWEEN HOLE AND TANGENT POINT), 13.4 (width of the deck at the left end), 32.0 ± 1.0 (width of the deck at the right end), and 11.0 (height of the deck at the right end). A note indicates 'HOLE FROM D2500 T DRILLING DETAIL'.

[illegible]

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07 03 37

306 SKI

ASSEMBLY

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 238

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: 61352
Part number: D205-634-041
Description: 205 skid tube
Welding Process: Tig[☒] Mig[]
Base material: Aluminium
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier Ped. Dahl Date of Test Coupon 10.08.25

Welder Barclay Elliott Date of Test Coupon 10.08.25

The above named individual is qualified in accordance with AWS D17.1.2001 to weld